

CLAIMS

1. A decision method for inter-frequency hard handoffs in a WCDMA system, using the event-triggered reporting mode, the triggering events including the following basic events: Event 2F(the signal quality on the current frequency point is higher than a certain threshold value), Event 2D(the signal quality on the current frequency point is lower than a certain threshold value), and Event 2A(the best frequency point changes, that is, there is a non-current frequency point on which the signal quality is better than the signal quality on the current frequency point), the decision method being characterized in comprising at least the following steps:

the RNC(Radio Network Controller) queries the specific conditions of the location where the UE(user equipment) is, and performs inter-frequency measurements, specifying the required measurement events to be 2F and 2D and the relative parameters;

the RNC sends measurement control commands to the UE, specifying the parameters that the UE is required to measure;

the UE receives the control commands and performs the measurement and evaluation, and reports the measurement results when the triggering criteria for the required events are met; and

the RNC receives the reported results from the UE, and begins to perform the decisions according to the specific events reported by the UE and the RNC's specific decision and execution process.

2. The decision method for inter-frequency hard handoffs according to Claim 1, characterized in that, said RNC querying the specific conditions of the location where the UE(user equipment) is and performing inter-frequency measurements is activating a compression mode to perform the measurements.

3. The decision method for inter-frequency hard handoffs according to Claim 1, characterized in that, said RNC querying the specific conditions of the location where the UE (user equipment) is and performing inter-frequency measurements is performing the measurements without activating a compression mode at the moment.

4. The decision method for inter-frequency hard handoffs according to Claim 1, characterized in that, said UE receives the control commands and performs the measurements and evaluation, the evaluation at the UE side being based on the following formula:

$$Q_{\text{carrierj}} = 10 \cdot \text{Log} M_{\text{carrierj}} = W_j \cdot 10 \cdot \text{Log} \left(\sum_{i=1}^{N_{Aj}} M_{ij} \right) + (1 - W_j) \cdot 10 \cdot \text{Log} M_{\text{Bestj}} - H,$$

wherein:

Q_{carrierj} is the dB value of estimated quality on frequency j;

M_{carrierj} is the estimated quality on frequency j;

M_{ij} is a measurement result of cell i in the active set on frequency j (in case of a non-used frequency point, they are the cells in the virtual active set);

N_{Aj} is the number of cells in the active set on frequency j;

M_{Bestj} is the measurement value of the best cell on frequency j; W_j is the weight factor for frequency j;

5. The decision method for inter-frequency hard handoffs according to Claim 1, characterized in that, said RNC's specific decision and execution process includes the following:

A. when Event 2F is triggered, the RNC requires the UE to perform the decision on Event 2D;

B. when Event 2D is triggered, the RNC requires the UE to

perform the decisions on Event 2F and Event 2A;

C. when Event 2A is triggered, the RNC makes a decision according to the results of the admission control and resource allocation and sends the corresponding message to the UE, and after the hard handoff is performed successfully, the UE performs again the decisions on Event 2F and 2D under the control of the RNC.

6. The decision method for inter-frequency hard handoffs according to Claim 5, characterized in that, after said Event 2F is triggered, the RNC can command the UE to stop using a compression mode to perform the inter-frequency measurements, and perform the measurements of the signal qualities in the cells only on the currently used frequency.

7. The decision method for inter-frequency hard handoffs according to Claim 5, characterized in that, after said Event 2D is triggered, the RNC can command the UE to activate a compression mode to perform the inter-frequency measurements, performing the measurements of the signal qualities in the cells on other frequency points.

8. The decision method for inter-frequency hard handoffs according to Claim 1, characterized in that, during the RNC's specific decision and execution process, there is a difference between the thresholds of Event 2F and Event 2D, which usually takes the value of 2 dB.